ERIC Document Resume	See Instruction Sheet	DATE OF RESUME	DATE RECEIVED

A. PUBLICATION DATA

1. ERIC NUMBER	2. ORIGINATOR CONTROL NO(S).	3. IDENTIFICATION NO.
ED001377	N.A.	N.A.

DO NOT WRITE IN SPACE BELOW

4. AUTHOR(S):
Hill, Kennedy T.

5. TITLE OF DOCUMENT ABSTRACTED:
The Effects of Social Reinforcement and Non-Reinforcement Following Success and Failure as a Function of the Level of Anxiety of S

6. PUBLICATION TITLE:
N.A.

MICROFILM COPY AVAILABLE YES ☒ NO ☐

COPYRIGHT GRANTED YES ☐ NO ☒

COPYRIGHT RELEASE FILED YES ☐ NO ☐

TYPE OF REPORT
PROPOSAL ☐
IN-PROGRESS ☐
FINAL ☒
FOLLOW-UP ☐

7. EDITOR(S):
N.A.

8. PLACE OF ORIGIN
ORG. University of Minn.
ST.
CITY Minneapolis, Minn.

9. PUBLISHER OR SOURCE
University of Minnesota
Minneapolis, Minnesota

10. VOL.	11. PAGES	12. MO./YR.	13. TOTAL PP.
N.A.	N.A.	3/65	8

TELE. EXT.
INST/LOC CODE

OTHER ERIC REFERENCES:

ERIC SATELLITE CODE

B. INDEXING DATA

14. SUBJECT AREA

15. TYPE OF ENDEAVOR
report

16. INDEXING TERMS (6-12)

social reinforcement	experimental task	success	high levels of anxiety
non-reinforcement	children's performance	failure	experimenter's role
adult influence	incentive values	success/failure relation	
	anxiety reduction	low levels of anxiety	anxiety

17. ABSTRACT (MAX. 250 WORDS)

The investigation studied the factors which determined the relative effectiveness of social reinforcement and non-reinforcement from adults on children's performance. It had been assumed that social reinforcement might have two effects, one derived from its incentive value and the second derived from its potentiality for reducing anxiety. The present study was designed to test the role of anxiety directly by assessing the effects of social reinforcement and non-reinforcement following success and failure for children of stable low and high levels of anxiety.

The experimental task was a marble dropping game; essentially, the apparatus consisted of a table with two bins, one containing over 1,500 marbles and the other covered by a plate with six holes. The child was instructed to pick up the marbles from the one bin and to put them in the holes of the plate covering the second bin. During the first minute of the task, the baseline period, the experimenter attempted to play an attentive but non-responsive role. During the remaining six minutes of the task, the experimental period, the experimenter either made a supportive comment such as "very good," or "that's fine" after the first response in every thirty second interval (social reinforcement conditions) or remained attentive but nonresponsive throughout the experimental session (non-reinforcement condition).

Results showed that performance was higher under social reinforcement than non-reinforcement for low anxious children following success, and the two reinforcement conditions differed minimally for both low anxious subjects after failure and the high anxious subjects after success. The predictions were not supported, however, for high anxious children following failure.

ERIC No.

18. SOURCE OF ABSTRACT

C. FUNDING DATA

19. SUPPORTING ORGANIZATION	20. DIVISION OR DEPT.	21. CONTRACT NO. / PROJECT NO.
	22. TOTAL COST OF PROJECT	
	23. DURATION OF PROJECT	U.S. Department of Health, Education, and Welfare Office of Education

ERIC Form 1

. . file: achievement

D01011

The Effects of Social Reinforcement and Nonreinforcement Following Success and Failure as a Function of the Level of Anxiety of S

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(Paper read at the biennial meeting of the Society for Research in Child Development, Minneapolis, March 25, 1965)

ED001377

The present investigation is one of a series of studies of the factors which determine the relative effectiveness of social reinforcement and nonreinforcement from adults on children's performance.

It has been assumed that social reinforcement may have two effects, one derived from its incentive value and the second derived from its potentiality for reducing anxiety. When normal children are tested under conditions which are not arousing, it is assumed that social reinforcement will facilitate children's performance at a simple task relative to the performance in a nonreinforcement control condition due to the incentive value of supportive statements from an adult. On the other hand, when children are tested under conditions that are anxiety arousing, it is assumed that: (a) supportive comments from an adult tend to reduce the child's level of anxiety, thus lowering his level of motivation and rate of response, and (b) a nonresponsive adult has the effect of maintaining or increasing anxiety, thereby raising the level of motivation and rate of response. It would be expected, then, that the tendency for social reinforcement to be more effective than nonreinforcement in increasing rate of response of children tested under conditions of nonarousal would be weaker, or possibly reversed, for children tested under conditions of arousal.

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Harold Stevenson and I recently reported (Stevenson & Hill, 1965) a study which was an initial attempt to test these hypotheses. In this study second grade children were presented pretraining tasks which insured success or failure. It was assumed that success in pretraining would reduce whatever anxiety the child may have had upon entering the experimental situation and predicted that following success performance at a simple marble dropping task would be higher under social reinforcement than nonreinforcement. On the other hand, it was assumed that failure in pretraining would raise the level of anxiety of the child and hypothesized that following failure social reinforcement would reduce the child's anxiety and hence level of performance, so that performance would be similar or lower under social reinforcement than under nonreinforcement. As can be seen in Figure 1, a significant interaction between pretraining condition and reinforcement condition supported these hypotheses.

The present study was designed to test the role of anxiety directly by assessing the effects of social reinforcement and nonreinforcement following success and failure for children of stable low and high levels of anxiety. In line with the above reasoning, it was expected that social reinforcement would be most effective for low anxious children following success, for whom only the incentive value of social reinforcement is presumed to be operating, and least effective for high anxious children following failure, for whom the anxiety reducing property of supportive comments is presumed to be operating most strongly. In contrast, nonreinforcement was expected to be least effective with low anxious children following success and increasingly effective at higher levels of arousal due either to failure in pretraining or a child's stable high level of anxiety. To summarize, a

triple interaction between the Level of Anxiety of S X Pretraining Condition X Reinforcement Condition is predicted: social reinforcement is more effective than nonreinforcement for low anxious subjects following success, the two reinforcement conditions differ minimally for low anxious children after failure or high anxious children after success, and social reinforcement is less effective than nonreinforcement for high anxious children following failure.

The 256 second grade subjects included 64 children of each sex at low and high levels of anxiety as defined by the Test Anxiety Scale for Children. The pretraining and reinforcement conditions were identical to those used by Stevenson and Hill (1965) and are summarized at the top of the first page of the attached handout. The child's experiencing of success or failure in pretraining was manipulated by presenting the subjects with one of two pairs of formboard-like puzzles. One pair of puzzles each consisted of interchangeable rectangular pieces and all children succeeded in assembling them in the time allowed. The other pair of puzzles, in contrast, each consisted of 11 irregular shapes (e.g. cup, fish) which fit inside the puzzle board in only one, precise, interlocking pattern. Although these puzzles appear solvable to children of the age of the present sample, no child has actually been able to complete them in the time allowed.

The experimental task was a marble dropping game which has been described in detail (Stevenson & Fahel, 1961). Essentially, the apparatus consists of a table with two bins, one containing over 1,500 marbles and the other covered by a plate with six holes. The child is instructed to pick up the marbles from the one bin and to put them in the holes of the plate covering the second bin. During the first

minute of the task, the baseline period, the experimenter attempts to play an attentive but nonresponsive role. During the remaining six minutes of the task, the experimental period, the experimenter either makes a supportive comment such as "very good," or "that's fine" after the first response in every thirty second interval (Social Reinforcement Condition) or remains attentive but nonresponsive throughout the experimental session (Nonreinforcement Condition).

An equal number of low and high anxious boys and girls were assigned at random to the four experimental calls and tested by one of four male and four female experimenters.

The measure of response for the experimental period was a difference score obtained separately for each subject by subtracting the base rate from the number of responses made during each of the six succeeding minute of the task.

The major results of the study are presented in Figure 2, which shows the mean difference score, per minute, of low and high anxious subjects tested in each of the four experimental calls: the points are connected for illustrative purposes.

The triple interaction of Level of Anxiety of S X Pretraining Condition X Reinforcement Condition was significant at the .01 level of confidence. As can be seen in Figure 2, the predictions were supported for low anxious children in general and for high anxious children after success. Performance was higher under social reinforcement than nonreinforcement for low anxious children following success, and the two reinforcement conditions differ minimally for both low anxious subjects after failure and the high anxious subjects after success. The predictions were not supported, however, for high anxious children following

failure. Contrary to expectations, performance was higher under social reinforcement than under nonreinforcement, a finding to be returned to shortly.

The results thus suggest a curvilinear relationship between both social reinforcement and nonreinforcement in relation to level of arousal if it is assumed that the test anxiety level of the child and the pretraining condition are additive measures of arousal. In this case, Ss are considered to be at three levels of arousal: low (low anxious Ss after success), moderate (low anxious Ss after failure and high anxious Ss after success), and high (high anxious Ss after failure). As can be seen in Figure 2, social reinforcement and level of arousal are related by a U-shaped curve, with supportive comments from an adult most effective in increasing the child's rate of response at low and high levels of arousal. In contrast, nonreinforcement and level of arousal are related by an inverted U-shaped curve, with nonresponsive adults obtaining higher levels of performance at moderate levels of arousal than at either extreme. As noted, these patterns result in social reinforcement being more effective than nonreinforcement at both low and high levels of arousal, while differences between the two reinforcement conditions are minimal at moderate levels of arousal.

The unexpected finding that performance is higher under social reinforcement than nonreinforcement for high anxious children following failure may be accounted for if it is assumed that the high level of arousal of such children provoked competing responses which were disruptive of performance at the experimental task. Significant changes in performance over the experimental period were congruent with such a position. For example, when the experimenter was nonresponsive to high

anxious children who had failed in pretraining, the cell in which it is assumed that anxiety and arousal would be maximal, performance decreased steadily over the experimental period, suggesting that competing responses were operating. On the other hand, when the experimenter made supportive comments to high anxious children who had failed in pretraining, performance decreased over the early minutes of the experimental period, when it is assumed that the social reinforcement was lowering anxiety and thus reducing the strength of competing responses, and then increased over the later minutes of the experimental period.

In order to test further the role of competing responses in the relative effectiveness of social reinforcement and nonreinforcement on children's performance at simple tasks, Barbara Moely and I are presently investigating the effects of social reinforcement and nonreinforcement as a function of game versus test instructions for children at two age levels in a study in which observations were made of potentially "competing" responses of subjects in addition to obtaining measures of rate of response at the marble dropping task described here. Such data should help clarify the complicated effects of social reinforcement and nonreinforcement which the present and other studies have revealed.

References

Stevenson, H. W., & Fahel, L. S. The effects of social reinforcement on the performance of institutionalized and noninstitutionalized normal and feebleminded children. J. Pers., 1961, 29, 136-147.

Stevenson, H. W., & Hill, K. T. The effects of social reinforcement and nonreinforcement following success and failure. J. Pers., 1965, in press. (Also reported in a paper read at the annual convention of the American Psychological Association, Los Angeles, September 4, 1964)

The Effects of Social Reinforcement and Nonreinforcement Following Success and Failure

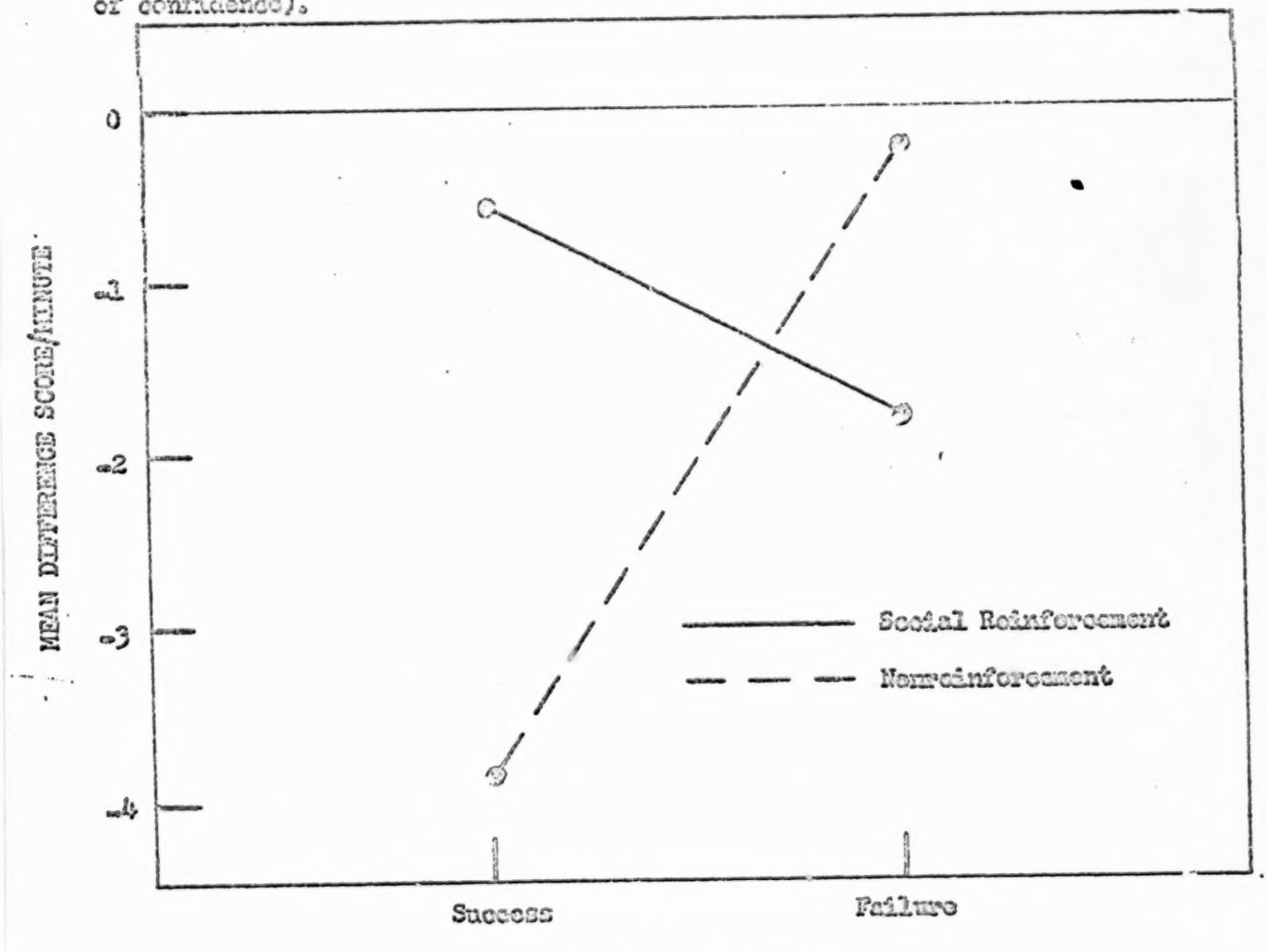
Harold W. Stevenson and Kennedy T. Hill
University of Minnesota

Subjects: 48 boys and 48 girls of CA 6-8 Experimenters: 2 male graduate students

Pretraining Condition: The child's experiencing of success or failure was manipulated by presenting S with one of two pairs of formboard-like puzzles. One pair of puzzles each consisted of rectangular pieces, and all Ss assembled these within the time allowed. The other pair each consisted of 11 irregular shapes which fit in only one precise pattern, and no S could complete these within the time allowed.

Reinforcement Condition: During a subsequent marble sorting task, and following a baseline minute, E made supportive statements ("very good," "fine") after S's first response in every 30 second interval for Ss in the "Social Reinforcement Condition." For Ss in the "Nonreinforcement Condition," E remained attentive but nonresponsive throughout the seven minutes of the task.

Figure 1. The mean difference score for each experimental condition (The interaction of Pretraining Condition X Reinforcement Condition was significant at the .001 level of confidence).



The Effects of Social Reinforcement and Nonreinforcement Following Success and Failure as a Function of Test Anxiety of S, Sex of S, and Sex of E

Kennedy T. Hill
University of Minnesota

Subjects: 128 boys and 128 girls of CA 6-8. Sixty-four children of each sex were low anxious and 64 were high anxious as defined by the Test Anxiety Scale for Children (on the basis of a median split).

Experimenters: Four male and four female graduate students

Pretraining Conditions and Reinforcement Conditions: Identical to those described on page 1.

Figure 2. The mean difference score for low and high anxious children for each experimental condition (The interaction of Test Anxiety of S X Pretraining Condition X Reinforcement Condition was significant at the .01 level of confidence).